This has been proved by continuous experience in the Arctic seas during the late half-century. For the above reasons your Committee deem it desirable to defer making their report, with a view to giving more definition to the objects sought to be obtained and to the best means of obtaining them, as also to expand this Committee, in order to elicit to the fullest extent the opinions and to secure support from those conversant with the various branches of science which are to be investigated during an exploration which, from its very important and serious nature, eminently merits the favourable consideration of this great and enterprising maritime nation.

NOTES

THE 59th annual meeting of the Association of German Naturalists and Physicians will take place at Berlin from the 18th to the 24th inst. General meetings will be held on the 18th, 22nd, and 24th, the sections, of which there are thirty, meeting at other times when and where they wish in the various places offered them for that purpose. At the same time there will be an exhibition of scientific apparatus, instruments, and educational objects. On the morning of each day a journal will be issued containing information of interest to members, and as much as possible of the proceedings at the various meetings of the preceding day. The Physical Section is under the Presidency of Dr. von Helmholtz and Dr. Kirchhoff. Amongst the papers to be read are the following:—The microscope as an aid to physical investigation, by Dr. Lehmann; the determination of the electro-chemical equivalents of silver, by Dr. Köpsel; electrical discharges, by Dr. Goldstein; on Palmieri's investigations into the development of electricity in the condensation of steam, by Dr. Kalischer. The Presidents of the Chemical Section are Drs. Hoffmann and Landolt. In this Section there will be papers on silver oxydul, by Herr von der Pforten; a new synthesis of naphthaline derivatives, by Dr. Erdmann; and on a peculiar phenomenon of reaction, by Herr Liebreich. In the Botanical Section there will be papers on Goethe's influence on botany, and on the reception of water by the external organs of plants. In the Zoological Section papers will be read on dual eyes in insects, on the origin of the frontal ganglion in Hydrophilus, on freshwater Bryozoa, the Protozoa of Kiel Bay, on the boundaries of zoo-geographical regions from the point of view of ornithology, the fauna of North German lakes, and on the old Peruvian domestic dog. In the Section for Geography and Ethnology there will be several papers on Africa, especially on the Congo region; one on the Kurds, others on South Polar exploration, on the Goajira Indians, and on the importance of the Xingu for the ethnology of the northern part of South America. A great majority of the sections are occupied with medical subjects. One of these will be devoted to the discussion of the condition of Europeans in different climates, their diseases, acclimatisation, &c. The last section of all is devoted to scientific education.

SIR HENRY ROSCOE has given notice that in the next session of Parliament he will call attention to the Report of the Departmental Committee on the National Science Collections, and will move a resolution.

IN reply to a question by Sir John Lubbock in the House of Commons on the 9th inst., the Chancellor of the Exchequer stated that the appointment of a Minister of Education, as recommended by the Committee of 1884, had not yet come under the notice of the Government, nor could he hold out any hope that it would be likely to come very soon under its notice. Lord Randolph Churchill said he suspected the proposal would involve an increased charge upon the public revenues, "and every alteration, reform, or modification of a department which would involve an increased charge possesses in my eyes an incurable defect."

EARTHQUAKES have continued at Charleston during the past week, but the shocks are decreasing greatly in frequency and violence. One occurred on Saturday night and one on Sunday, but no harm was done by either. The Mexican Government has been officially informed that Tequisixtlan was shaken by an earthquake at 4.30 on the morning of September 3. The movement was from east to west. A Naples correspondent of the *Times* writes that the shock of the 28th ult. was severer than any which has been felt for some years. The panic was therefore great, and was increased by superstition. There were two shocks—one was horizontal, the other vertical, but they followed each other in such rapid succession that they appeared to be one shock, and for many hours after the replica was expected with much apprehension. The shocks occurred about 11 p.m., and were felt severely at every place in the Bay of Naples, and in the Island of Capri, which has no volcanic element in its formation. Similar reports were received from Puglia, Calabria, and Sicily, where the shock was very severe. At Forio, in the Island of Ischia, it was felt, and created a panic. Vesuvius has long been in a state of comparative repose Prof. Palmieri says that at 4 p.m. on the 28th it showed signs of renewed activity by frequent thunders, and by throwing masses of lava into the air.

MR. POND, the Government Analyst of New Zealand, has proved by actual experiment that the dust thrown out during the recent volcanic eruptions is of a highly fertilising kind. He obtained samples of the dust from three different places, and sowed a quantity of clover and grass seeds in each. The soil was kept moistened with distilled water, so that no manurial elements might be imparted by the water used. In all cases the growth was almost as vigorous as in rich volcanic soil. The rapid growth of the plants and their colour show that the dust is a benefit to the soil on which it has fallen.

THE programme for the autumn meeting of the Iron and Steel Institute, which is to be held in London on October 6, 7, and 8 next, has just been issued. The Council of the Institute has arranged to hold the meeting in London this year, for the second time in the history of the Society, with a view to affording Members the opportunity of studying the mineral resources, &c., of the colonies, as illustrated by what is shown at the Exhibition, and of coming into contact with colonists and Indians who are interested in mineralogical operations. That being so, perhaps the most interesting paper in the list is one on the iron-making resources of our colonies, prepared by Mr. Gilchrist (whose name is associated with the well-known basic process) and Mr. Edward Riley. Among other papers to be read there is one on the chemical composition and mechanical properties of chrome steel, by M. Brustlein; another on combustion with special reference to its application in the arts, by Mr. F. Siemens; another on the treatment of high-class tool steel, by Mr. A. Jacobs, of Sheffield; and one on modifications of Bessemer converters for several charges, by Mr. John Hardisty, of Derby.

THE Paris Academy of Sciences has issued in separate form the text of the discourses pronounced at the Museum of Natural History on the occasion of M. Chevreul's centenary, August 31, 1886. The speakers were M. Fremy, Director of the Museum; M. Jules Zeller, President of the Institute; M. Janssen, on behalf of the Academy of Sciences; M Broch, Corresponding Member of the Institute; Colonel Le Mat, in the name of the Washington National Institute; M. Ressmann, Italian Plenipotentiary; M. Gilbert Govi, President of the Neapolitan Academy of Sciences; M. de Bouteiller, on behalf of the Paris Municipal Council and the General Council of the Seine; M. Chaumeton, President of the Association of French students; MM. Nadault de Buffon, Dehérain, Leroy, Auguste Vitu, Gerspach, and Réné Goblet. The brochure is printed in uniform size and type, with the weekly *Comptes rendus* of the Academy.

THE Paris newspapers have published a congratulatory communication from the Academy of Sciences in Berlin to M. Chevreul, from which the following is an extract:—"He who would form a complete idea of your so busily occupied life should follow the entire course of your creative activity, which has been directed to all departments of chemistry. He must follow all the innumerable detailed researches which have enabled you to determine the nature of various minerals and of a large number of salts, as well as the composition of many organic matters. He should study your chemico-physiological works, by which you have made such great advances towards the knowledge of the most important secrets of the animal organism as well as your labours on the most varied questions of public hygiene. He ought to follow the excursions which enabled you to fix the laws of the contrasts among colours, and to class them systematically and scientifically. He ought to study your lectures on the chemical principles of dyeing. He should finally imagine himself at the period when misty ideas of the most false and fantastic kind threatened to surround and obscure the mind, and when, with the record of history in your hands, you dissipated the mists by making your countrymen recognise in the delusions of the past the errors of the present time. Having thus represented in all its extent the activity that you have shown throughout your long life, we hold that your name should be inscribed in one of the first places on the list of the great men who have carried the scientific glory of France to the extremities of the earth."

IN a long communication to the *Times* of September 7 from its Correspondent with the Grenada Eclipse Expedition, it is stated that a botanical garden is in course of formation under Mr. Elliott, with a view to the development of the resources of the island. Mr. Elliott, the article goes on to state, "has made frequent excursions into the high woods for the latter purpose, and the results of his botanical exploration of the island, which will soon be made known, are very satisfactory, many valuable woods having been found. It is hoped by means of the botanic garden to encourage the planters of the Windward Islands to cultivate the minor products of this fertile region, and especially to improve their fruits by exhibiting the finest kinds in the gardens brought from other regions and giving information showing how it can be done. No more healthy sign of the progress of the colony could be afforded than in the enterprise of the Colonial Government in establishing such a garden and the interest taken in it by the planters of the island. So much for applied botany. During the stay of the Expedition pure botany has been studied with much success by Mr. George Murray, of the British Museum, the naturalist attached to the Expedition, who arrived a fortnight before the observers of the eclipse to gain the necessary time for finding good working grounds. His special mission is an inquiry into the life-history of certain marine *Algæ* called the *Siphoneæ*. The forms of this group are well enough known to European botanists, but the development and life-phenomena of most of the genera composing it have not yet been investigated. He has been greatly gratified to find an abundant supply of material for his special research, though the island is poor in *Algæ* owing to the small rise and fall of the tide, which exceeds a foot only at spring tides. The operation of examining this material is conducted in a well lighted and very convenient room set apart for the purpose by His Excellency the Governor, who has in this instance, too, shown the greatest sympathy with the object of the work, and an unfailing helpfulness towards its accomplishment. So far as the examination of the material collected has gone, it promises to yield an answer to the question of the nature of the reproduction and development of the types investigated, but whether the information will result in fixing definitely the position of the *Siphoneæ* as a group or in the breaking up of the group and the incorporation of certain genera into other orders, already better known, cannot, of course, yet be determined. The land and marine fauna are also engaging Mr. Murray's attention to the extent of collecting these, and the reptiles and small mammals have in this department of work been kept particularly in view."

MR. JOHN TAYLOR, a pupil of Dr. Marshall Ward, who went out some time ago as botanist to the Bahamas Government, is evidently pursuing his work under difficulties. While he and his companions were on shore at Acklin Island, 30 miles from Long Cay, on August 13, the cook, a Haytian, who was left in sole charge of the vessel, made off with it under cover of darkness, and up to the 19th no trace of ship or cook was found. Mr. Gardiner had on board nearly all his scientific books, and all the instruments, &c., necessary for a month's good work. He lost everything of that kind he had, including his Zeiss microscope; besides all his manuscript scientific diary, and list of the Bahamas flora, not to mention a sum of money, bedding, &c. His total loss he estimates at 75*l.*; we are sure the Bahamas Government will not allow Mr. Gardiner to sustain a loss which to him must be serious.

THE translation of an English botanical book into German is so much a reversal of the present fashion that it is of some interest to know that a translation of Dr. Maxwell Masters' "Vegetable Teratology" has been made by Mr. Udo Dammer, and published by Haessel of Leipzig. Many additional notes have been added by various German and Italian botanists, as well as by Dr. Masters, and some additional woodcuts provided.

THE celebrated waterfall of Teverone, which Horace calls "*præceps Anio*," has been employed to put in operation two dynamos of 100 horse-power for the illumination of the city of Tivoli. Others are being fitted up. The motive power, which is to be utilised by a company from the designs of M. Cantoni, is equivalent to several thousand horses. The illumination of Rome is contemplated, as well as the distribution of force to a distance from the station. The excavations and canals are conducted under the house of Mæcenas, which is described as situated at *udum Tibur*, now Tivoli.

TWO more of the Paris theatres are now illuminated by incandescent light—the Palais Royal by Edison, and the Variétés by Woodhouse. With the Opera and the Eden Theatre this brings the number up to four. Every evening the Industrial Exhibition at the Palais des Champs Elysées is lighted also by electricity.

WE have received a copy of a paper read by Mr. H. C. Russell before the Royal Society of New South Wales, on "Local Variations and Vibrations of the Earth's Surface," in which he records his own experiences on this subject in the hope that other astronomers will do the same, and thus by united action assist in the work of tracing these vibrations and changes. Mr. Russell's observations took place at Lake George, and were made chiefly by means of an automatic recorder of the height of the water in the lake. Although the instrument used has not the extreme sensitiveness to minute vibrations which Mr. Darwin's reflecting mirror and similar instruments have, yet it was so placed that all such changes became magnified by the relatively enormous extent over which it extends its sensitive part, if this expression may be used; for any change in gravity, or the direction of the vertical, is not seen as it affects the base of a small instrument a few feet square, but as it affects a surface 20 miles long and 5 to 6 miles wide. Barometric and wind changes, too, so difficult to see in other instruments, at once became evident here by their effects on such a large body of water, and the lake-gauge for these reasons is not only capable of showing changes quite as minute as the Cambridge pendulum apparatus, but also of keeping a perfectly satisfactory record of these changes, so written that many, if not all, the causes can be traced in the curves which they produce. Various tables and diagrams are appended to the paper.

COLONEL GILDER has started from Winnipeg on his expedition to the Arctic regions, with the object of reaching the North Pole.

THE deaths are announced of M. Paul Soleillet, the explorer of Shoa in North-East Africa, and of Herr Robert Flegel, the explorer of the Niger and Binué.

THE celebrated traveller and botanist, Dr. Schweinfurth, lectured recently at Berlin on the Kew Botanical Gardens, which he characterised as the finest in the world. Kew, he said, is the Botanical Foreign Office for all nations, for it is the centre of all botanical news from all parts of the world.

WE have received "An Account of the Progress of Astronomy in the Year 1885," compiled for the Smithsonian Institution by Prof. W. C. Winlock. The investigations reviewed comprise (among others) Prof. Pritchard's photometric researches as consigned in the Oxford "Uranometria," M. Dunér's catalogue of stellar spectra of the third type, Drs. Gill and Elkin's determination of southern star-parallaxes, Prof. Bakhuysen's of the rotation-period of Mars, Prof. de Ball's of the nutation constant, Prof. Peters' of the orbit of 61 Cygni, and Prof. Langley's inquiries into the temperature of the moon's surface. M. Faye's theory of the origin of the solar system, with Prof. G. H. Darwin's criticisms upon it in NATURE, are prominently dealt with. We hear with pleasure of the progress towards completion of Prof. Rowland's photographic map of the normal solar spectrum. The amount of detail contained in it may be judged of from the one fact that 120 lines are visible between H and K, the original negatives showing 150. The most striking astronomical events of the year, *i.e.* the outburst of new stars in Andromeda and Orion, the photographic discovery of a nebula in the Pleiades, and the meteoric shower of November 27, are chronicled in due and interesting detail. Seven comets were observed in 1885, of which five were seen for the first time, the others being expected returns of Encke's and Tuttle's. Nine minor planets were discovered. The Report concludes with a useful bibliography of astronomical works published in 1885.

IN March, 1884, Prof. Holden offered to observe at the Washburn Observatory the 303 fundamental stars for the southern zones of the "Astronomische Gesellschaft." The offer was accepted; the work was begun May 2, 1884, and finished December 25, 1885. The results are contained in vol. iv. of the "Publications of the Washburn Observatory," now before us. When Prof. Holden was appointed to the Lick Observatory in October 1885, 468 observations were still wanting to complete the series. These were very creditably supplied, before the end of the year, by his assistants, Mr. Updegraff and Miss Lamb. In all, 6444 observations were made with the Repsold meridian-circle; each star of the 303 was completely observed six times; and instrumental constants were determined for each night. No pains were spared to secure accuracy. The probable error of a single bisection of Polaris was estimated at not above 0 ·1 for poor seeing, and 0″·05 under the most favourable conditions. A list of corrections to standard star-catalogues (p. 69) forms a valuable addition to the contents of the volume.

WE have to acknowledge the receipt of the Calendars for the Session 1886–87 of the University Colleges of Dundee and Bristol, and of the Durham College of Science of Newcastle-on-Tyne.

THOSE interested in natural history will be glad to hear that Mr. Quaritch issues this week vol. iii. (the "Quadrupeds") of the Memorial Edition of "Bewick's Works," which he is publishing—to be complete in five volumes.

THE additions to the Zoological Society's Gardens during the past week include a Spring-bok (*Gazella euchore* ♂) from South Africa, presented by Capt. John Hewat, C.M.Z.S.; two Talapoin Monkeys (*Cercopithecus talapoin*) from West Africa, presented by Mr. R. E. Dennett; two Red-headed Finches (*Amadina erythrocephala* ♂ ♀) from South Africa, two Saffron Finches (*Sycalis flaveola* ♂ ♀) from Brazil, presented by Mr. H. B. James; a Leadbeater's Cockatoo (*Cacatua leadbeateri*) from Australia, presented by Mr. J. Davis; a Roseate Cockatoo (*Cacatua roseicapilla*) from Australia, presented by Mr. G. H. Hawtayne, C.M.Z.S.; a Herring Gull (*Larus argentatus*), British, presented by Mr. E. Penton, jun., F.Z.S.; a West African Python (*Python sebæ*) from West Africa, presented by Major A. Morton Festing; a Smooth Snake (*Coronella lævis*) from Hampshire, presented by Mr. W. H. B. Pain; a Leonine Monkey (*Macacus leoninus* ♂) from Arracan, deposited; two Crested Pigeons (*Ocyphaps lophotes*), a Geoffroy's Dove (*Peristera geoffroii*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN

THE INNER SATELLITES OF SATURN.—Writing in the *Astronomische Nachrichten*, No. 2743, Prof. Asaph Hall states that he has now finished the reduction and discussion of the observations of Titan and the five inner satellites of Saturn made at Washington since the mounting of the 26-inch refractor in 1873. These observations have been made with the filar micrometer, and most of them are observed angles of position and distances. The average probable error of a single observation for the position of a satellite is ± 0″·27. A remarkable result of the discussion is that the Washington observations of the five inner satellites can be satisfied within the limits of their probable errors by circular orbits. At the beginning of this discussion Prof. Hall hoped that the observations would determine the positions of the lines of apsides with such accuracy that the motions of these lines would be known, and that thus we might obtain data for a new determination of the mass of the Ring, and of the figure of the planet. But the resulting circular orbits for the inner satellites make the position of a line of apsides indeterminate, and for the present the mass of the Ring remains unknown.

On account of the difficulty of making good micrometrical measurements of the inner satellites of Saturn, astronomers have revived the old method of observing their conjunctions with the ends of the Ring, or with some other marked feature in the Saturnian system. A series of observations of conjunctions with the ends of the Ring was made at Toulouse in 1876 and 1877 by MM. Tisserand and Perrotin; and in order to test the old method of observing, Prof. Hall has compared these measures with his elements of the five inner satellites. The result at which he arrives is that the probable errors of a single residual are larger for the Toulouse observations (= ± 0″·41 in the mean) than in the micrometrical measurements at Washington. Prof. Hall therefore concludes that observations of these satellites with filar micrometers are among the best we have, and since they are definite measurements, and are made in very different positions, a result deduced from them is more likely to be free from constant errors. He suggests that probably the best way to effect an improvement in such measurements is to devise some new arrangement of the wires of the filar micrometer.

THE INVENTION OF THE SEXTANT.—Dr. J. L. E. Dreyer points out, in the *Astronomische Nachrichten*, No. 2739, an historical error which has crept into several astronomical works, although it was refuted some fifty years ago by Prof. Rigaud in a series of papers communicated to the *Nautical Magazine*. In the books referred to, it is stated that the principle of the construction of the sextant was communicated to John Hadley by his brother, a Capt. Hadley, who had in his possession a sextant given to him by Capt. Godfrey, brother of Thomas Godfrey, of Philadelphia, the real inventor of the instrument. But it appears there never was such a Capt. Hadley. The brothers of John Hadley were—one a barrister, the other a physician; and he himself was not an instrument-maker by profession (as has been asserted), but, as an amateur, occupied himself with mechanical pursuits, and was the first to bring the polishing of reflecting-telescopes to any perfection. On May 13, 1731, John Hadley